Installation procedure for the Wisy Rainwater system

RAINHARVESTING · SYSTEMS

Guidance notes for the installation of systems with WFF filter and submersible Multigo pump.

Please leave these notes and the manufacturers literature, with the householder or person responsible for maintaining the system

These notes are intended as a guide only, the individual components have their own instructions. Details may vary from system to system, depending on such factors as layout and type of tank used. The use of non-standard European-style electrical plugs prevents other non-compatible appliances being connected into the system.

System design

There are three important principles of rainwater storage that ensure the quality of stored water. Firstly, water that enters the tank must be 'calmed' - i.e. rather than openly discharge into the tank it should be directed to the bottom where it can gently percolate upwards, below the minimum water level.

Secondly, the tank must overflow periodically, at least twice per year, in order that any floating debris can be removed by the skimming effect of a suitable overflow device. For this reason the volume of the tank should be carefully calculated to ensure that overflow conditions occur.

These first two principles are taken care of by the 'calmed inlet' and the 'multisiphon' overflow trap fitted to *RainSava* tanks as supplied by ourselves. If you have sourced or constructed your own tank, similar arrangements should be incorporated into the design.

Thirdly, water should be extracted from the cleanest part of the tank; i.e. just below the surface, as achieved by the use of a fixed or floating suction filter. This ensures that the water extracted avoids both floating debris and bottom sediments. It is important that this bottom sediment is not disturbed as in time it will form a beneficial biological layer that assists in maintaining water quality.

Your rainwater system has been designed with these principles in mind and it is important for the well-being of the system that they are observed. It is also important that any water entering the tank should be as clean as possible and this is ensured by use of Wisy rainwater filters. It must therefore be observed that the filter elements are only removed for cleaning purposes and that this is done when no water is flowing through the unit (i.e. in dry weather!)

It is most important that these filters are kept clean and we therefore recommend that the stainless steel filter element of all Wisy FS or WFF filters is removed for cleaning approximately every two months (or more often if it proves necessary). A visual check is not sufficient. Often the filter element is dirty even when it appears clean to the naked eye; a biofilm can develop within the fine mesh, effectively blocking the holes. Cleaning is achieved by either brushing with a fine nylon

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brush with washing up liquid and running water or in a dishwasher. Blowing through with a high pressure air-line has also proved effective.

This is the only routine maintenance necessary for the operation of the system, although we do recommend a visual check of the tank and its' components on an annual basis.

The system is made up of a number of separate components. Some of these are to be located in the underground storage tank, whilst the flow controller, the mains water top-up assembly and the level gauge (if used) are to be fitted in a convenient location within the building (e.g. utility or plant room). The schematic diagram that follows on page three gives a general overview of the layout.

IMPORTANT:

- **Please read and understand these notes fully and plan where each of the components will be fitted before commencing work.**
- **Decide upon the location of the components, particularly the pump controller, the mains water top-up assembly and the tank level gauge. These items must all be located in a dry, frost-free position, e.g. utility room.**
- **Refer to the accompanying drawings.**
- **Where 32mm MDPE pipe is used it should be black or green, not blue, or else clearly marked to distinguish it from the mains water supply.**
- **Interior pipework should also be clearly identified as non-potable. We stock a self-adhesive marker tape for this purpose.**
- **IT IS MOST IMPORTANT that all pipe joints are tight and securely sealed. Even a small leak can cause the pump to cut out or run continuously.**
- **Install the WFF filter following the instructions included with it.**
- **We recommend that where WCs or other appliances fitted with float inlet valves are connected to the system, these should be of a rapid shut-off or equilibrium type – e.g. 'Fluidmaster or 'Torbeck'**
- **Note that the electrical plugs on the pump and solenoid valve are of the continental type. These fit into corresponding sockets and on no account should you attempt to change these for UK plugs.**
- **The 'Controlmatic' flow controller is supplied with a UK 13amp plug top and a UK adapter is supplied with the mains top-up kit.**
- **All electrical work should be carried out by a qualified electrician.**
- **Please ensure that all documentation supplied is left with the householder.**

Services Required:

- 230v 13A power supply for the pump controller
- 230v 3A power supply for the mains water top-up unit
- 15mm cold water feed for the mains water top-up unit

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Suggested work schedule

Phase 1

These works constitute part of the buildings drainage system and are normally carried out at groundworks stage.

- Ascertain depth of excavation for storage tank. This is dependent upon the invert level of the drain, the type of filter used, and the size of tank. particular attention should be paid to this in order that the tank is installed at the correct depth.
- Excavate hole and install tank (refer to manufacturers installation guide)
- Connect tank overflow to soakaway or storm drain
- Install service duct from tank to building (e.g. utility room or plant room). N.B. – ensure that suitable draw cords are laid into the duct in order to pull the pipe and cables through at a later stage. KEEP THE DUCT AS STRAIGHT AS POSSIBLE AND USE ONLY LONG-RADIUS BENDS
- Insert the pump delivery pipe (either flexible hose or MDPE pipe) through the duct. This is best achieved by inserting the pipe into the duct at the tank end. The pipe can then be pulled through from the top end using one of the draw cords, Use care to ensure that no debris enters the pipe (Or is left in it) during this operation.
- Excavate hole and install rainwater filter and connecting pipes (refer to manufacturers installation guide)
- Connect 110mm pipe from filter to tank inlet.
- Install mains water top-up pipe from building to join this pipe. (i.e. it should connect into the pipe between the tank and the filter)
- Connect filter waste outlet to soakaway or storm drain

Phase 2

The following works constitute part of the mechanical and electrical installation and are normally carried out at the final stage of building.

- Install the pump and suction filter/float switch assembly into the tank.
- Connect the outlet hose of the pump to the MDPE pipe using the brass elbow connector provided.
- Pull the pump cable, float switch cable and air pipe from the level gauge through the duct, using the second draw cord.
- Fit the pump controller, mains top-up unit and level gauge in the building (e.g. utility or plant room)
- Make mechanical and electrical connections to pump controller, top-up unit and level gauge.
- Commission the system.

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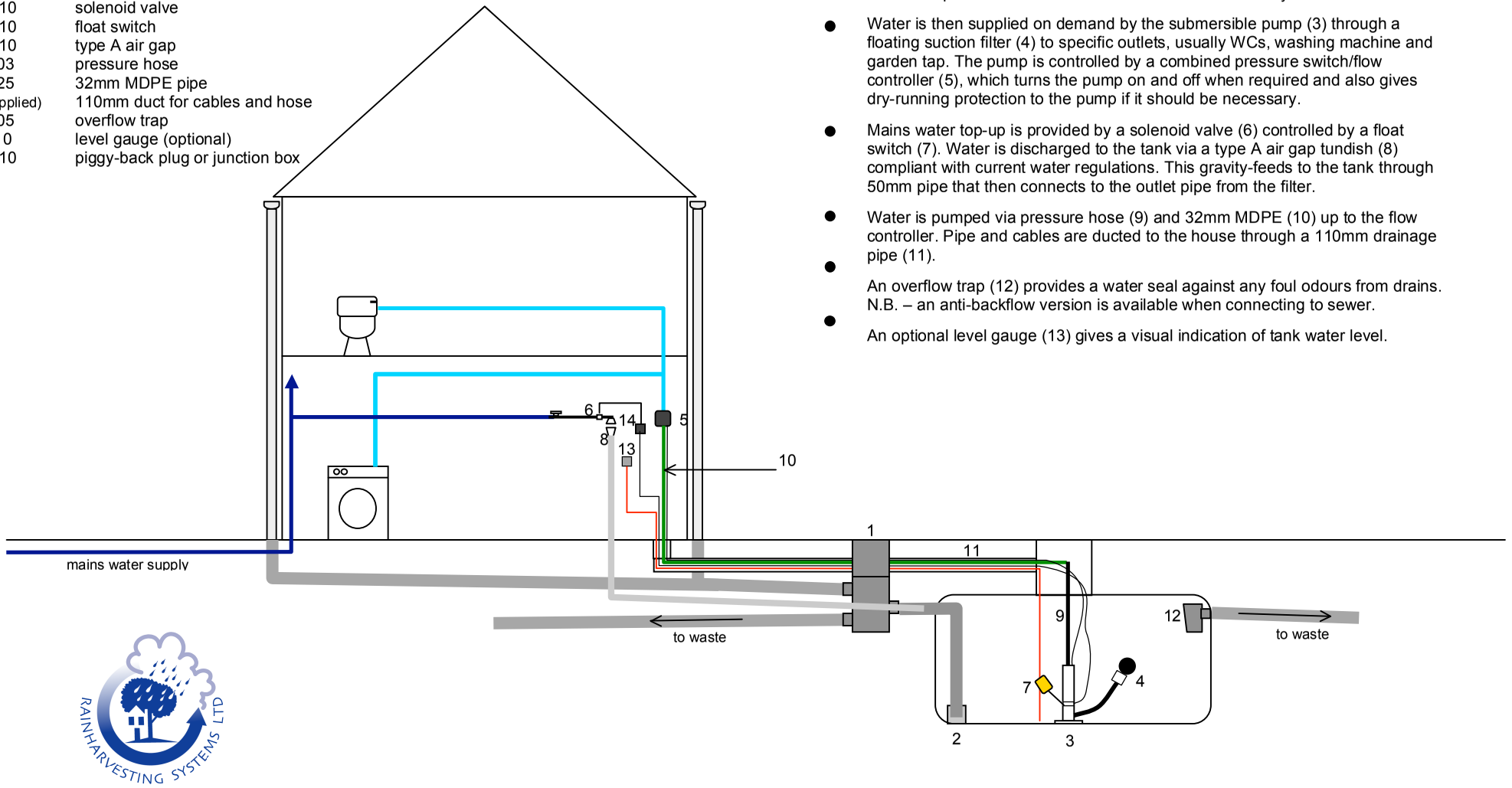
WISY rainwater system with WFF filter, submersible pump and remote mains top-up

Components

1. WF2011	WFF filter
2. EB0300	calmed inlet
3. UP0101	submersible pump
4. SS9931	suction filter
5. UP0101	pump controller
6. TW8810	solenoid valve
7. TW8810	float switch
8. TW8810	type A air gap
9. DS2003	pressure hose
10. EU3225	32mm MDPE pipe
11. (not supplied)	110mm duct for cables and hose
12. US1005	overflow trap
13. FA9910	level gauge (optional)
14. TW8810	piggy-back plug or junction box



- Rainwater is collected from the roof drainage system by the underground Wisy WFF vortex filter (1). This filters out the debris from the water and diverts about 85% of it into the storage tank. The remaining water goes to soakaway or storm drain in the usual manner, as does the excess water from the tank. As water enters the tank it passes through a calming inlet (2) which calms the flow of water and prevents disturbance of the float switch and any sediments.
- Water is then supplied on demand by the submersible pump (3) through a floating suction filter (4) to specific outlets, usually WCs, washing machine and garden tap. The pump is controlled by a combined pressure switch/flow controller (5), which turns the pump on and off when required and also gives dry-running protection to the pump if it should be necessary.
- Mains water top-up is provided by a solenoid valve (6) controlled by a float switch (7). Water is discharged to the tank via a type A air gap tundish (8) compliant with current water regulations. This gravity-feeds to the tank through 50mm pipe that then connects to the outlet pipe from the filter.
- Water is pumped via pressure hose (9) and 32mm MDPE (10) up to the flow controller. Pipe and cables are ducted to the house through a 110mm drainage pipe (11).
- An overflow trap (12) provides a water seal against any foul odours from drains. N.B. – an anti-backflow version is available when connecting to sewer.
- An optional level gauge (13) gives a visual indication of tank water level.

Installation Procedure

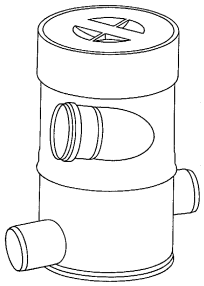
1. **Pipework**. When using a storage tank located below ground with the WFF vortex filter, three entry holes will be required into the tank.

- One to accept a 110mm pipe from the filter unit
- One to accept a 110mm pipe to act as a duct through which can pass the power supply cables to the pump and the float switch, and the tube from the level indicator, if used.
- One to accept a 110mm pipe for the overflow to the soakaway - *NB - this must be the lowest entry point.

Be sure to obtain a tight seal wherever pipes connect to the tank! One method is to use a rubber connector such as Osma part no. 4S.206 in a hole 115mm diameter. ***Rainsava tanks supplied by ourselves are pre-fitted with the necessary connections.***

Stage 1 - Groundwork

2. A fall of at least 1:100 must be provided for the water inlet pipes. All pipework in the ground should be bedded and surrounded with 150mm pea gravel or sand.



3. Install the WFF filter according to the instructions supplied with it. Ensure that the two outlet connections of the filter are connected to the appropriate pipes. The lower of the two must connect to the storm drain, the upper one to the tank. Please retain the filters' instructions as this contains important information regarding maintenance of the filter.

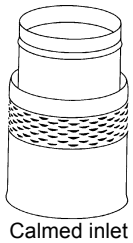
4. Locate the tank in the ground allowing for a sufficient fall from the WFF filter outlet. With some tanks it may be necessary to fit an inspection chamber over the top of the tank lid in order to bring it to ground level. Some tanks are specifically designed for below ground installation. Others will require a chamber to be constructed.to house the tank Seek advice from your tank supplier. *Rainsava* tanks supplied by ourselves are supplied with full installation instructions.

5. Lay the 110mm pipework to and from the WFF filter and from the tank to the soakaway. Rainwater downnpipes should join directly to drainage pipes via drain connectors and not via gully traps. This avoids the risk of someone inadvertently pouring undesirable liquids into the system, resulting in contaminated water. (e.g. painters slops, garden chemicals etc.) The pipe leading into the filter must only be connected to rainwater downpipes and must not receive surface water run off. The WFF100 filter accepts standard 110mm pipe.

6. In high ground water conditions, where there is a risk of water backing up from the soakaway into the filter unit, we recommend the use of an inline flap valve on the waste outlet pipe from the filter unit. The tank should also be protected by the inclusion of the special anti-backflow overflow trap.

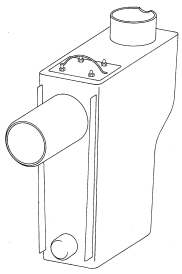
Stage 2 - Storage tank

7. The pipe from the filter to the tank must be 110mm and should enter and then continue right to the bottom of the tank where it should terminate in a **calmed inlet** (Wisy part no. EB 03 00, or



Calmed inlet

you could make your own). N.B. - If using a *Rainsava* tank purchased through us this item is pre-fitted.

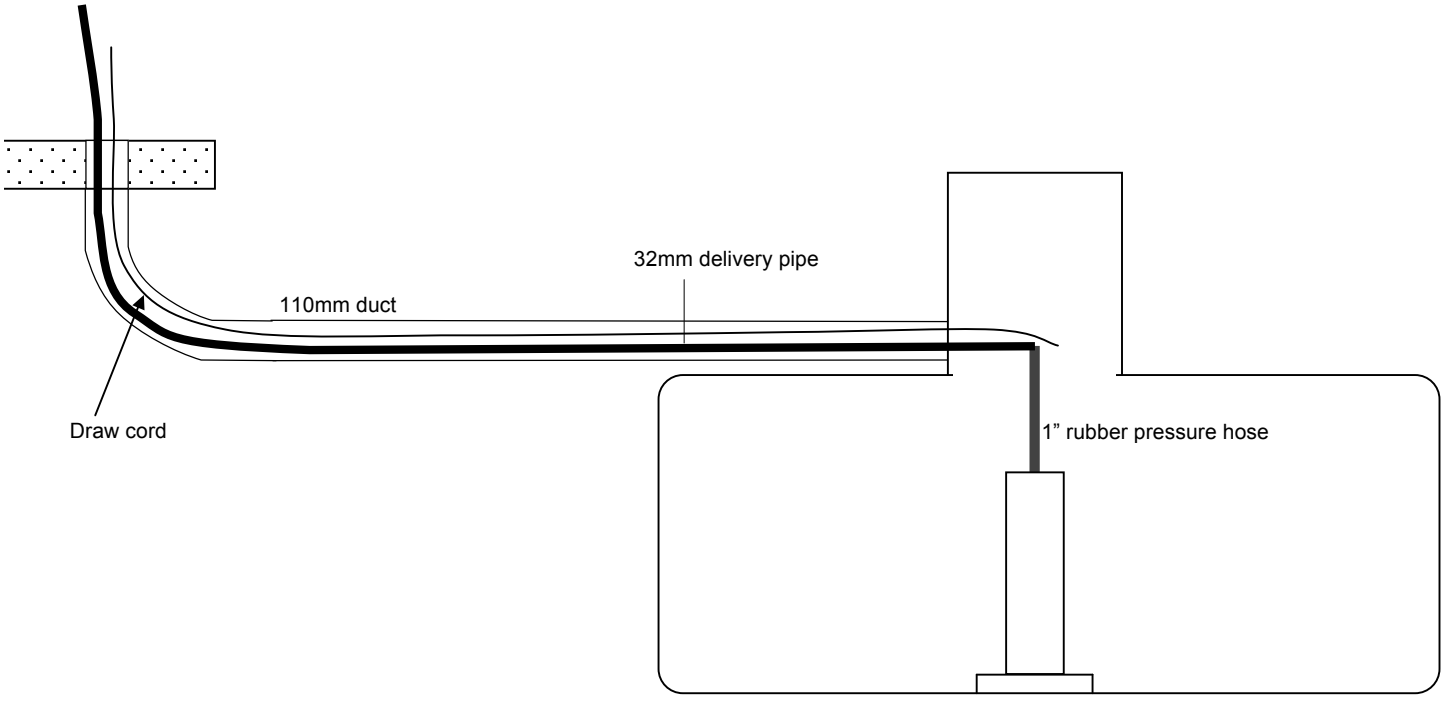


Wisy overflow trap

8. The overflow pipe from the tank should have an **overflow trap** on the inside of the tank in order to prevent foul odours entering. Either assemble your own or use a purpose made unit available from us (Wisy part no. US 10 05). If using a *Rainsava* tank purchased through us this item is pre-fitted.

9. Lay the pipework for the mains water top-up from a suitable point in the building. The pipework inside the building should be 50mm waste, then change to below- ground waste pipe using a suitable adapter (e.g. Osma part nos. 4D.299 or 4S.096). This pipe can then be joined to the 110mm pipe that connects the filter outlet to the tank. This way both mains and rainwater can enter the tank through the same inlet pipe. (see drawing page 6)

10. Lay the 110mm pipe to act as ducting from the building to the tank. Avoid sharp bends to ease the task of feeding the pipe and cables through the duct (use two 45º bends rather than one 90º). A nylon draw-cord should be placed into the duct when it is laid to enable the cables to be pulled through. Do not backfill any trenches until the installation is complete and the system has been tested.

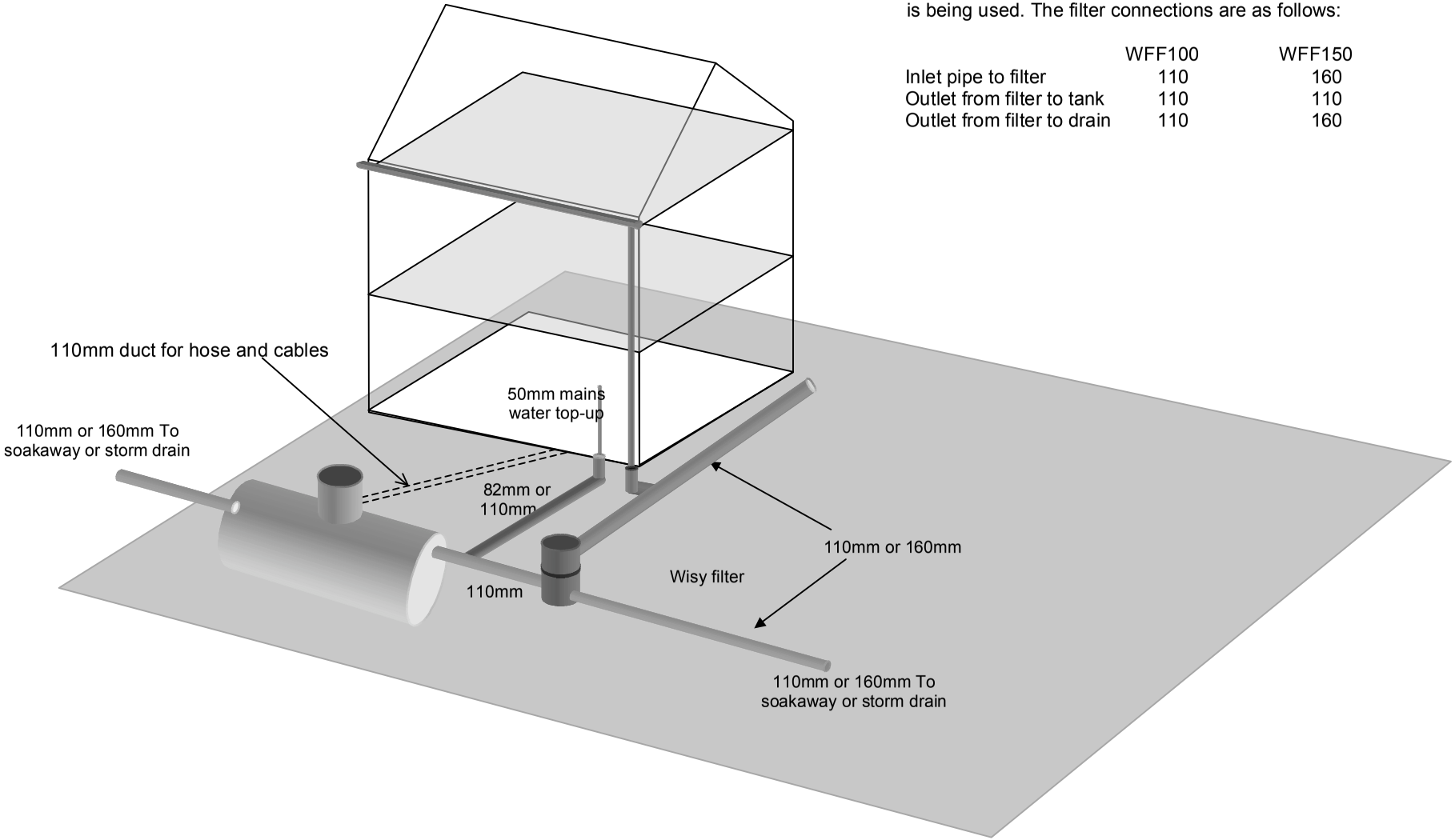


11. Lay the 32mm MDPE pipe from the house to the tank: the pipe should be of sufficient length to reach from the centre of the tank directly above the pump to the location of the pump controller in the house (see page 8).

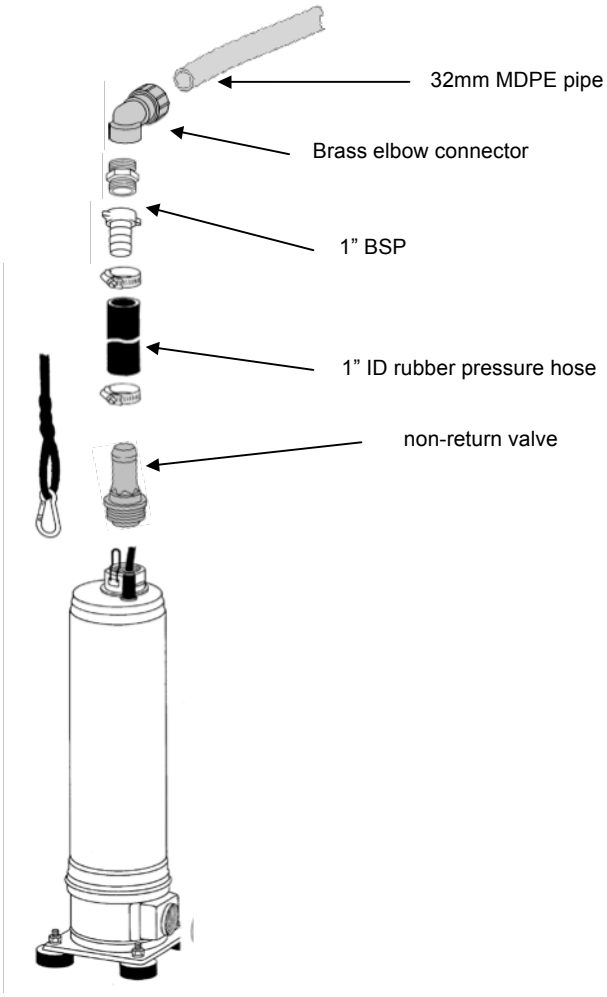
Suggested layout for mains water top-up and drainage pipes connected to the filter and storage tank. For clarity other components are not shown here.

Note: pipe sizes will vary depending on which WFF filter is being used. The filter connections are as follows:

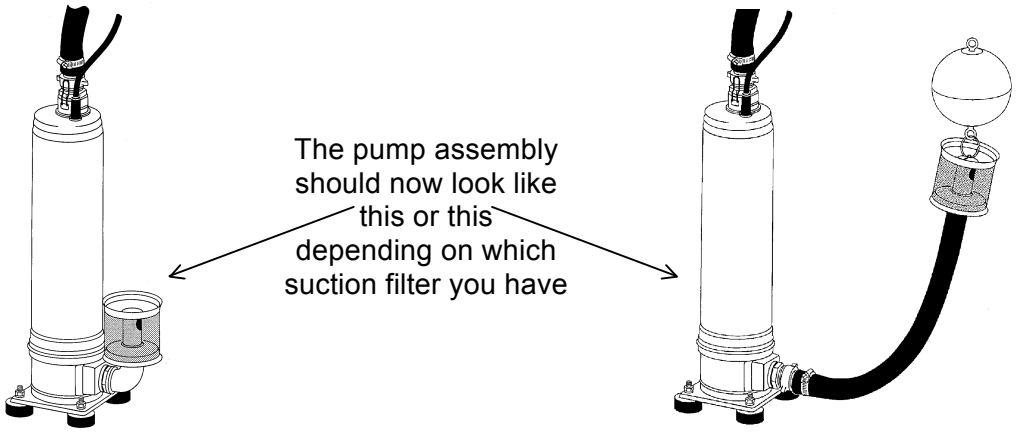
	WFF100	WFF150
Inlet pipe to filter	110	160
Outlet from filter to tank	110	110
Outlet from filter to drain	110	160



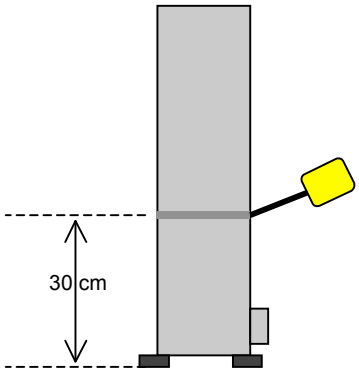
12. **Pump**. Fit the rubber feet to the baseplate of the pump, and fit the non-return valve to the outlet (top) port. Assemble the short length of <u>plain</u> rubber pressure hose and the brass fittings and the worm-drive hose clamps as shown in the diagram. Connect this to the nozzle of the non-return valve. <u>IMPORTANT: The hose will need to be cut to length</u> so that it can be connected to the MDPE pipe from the duct – this can be measured with the pump in the tank on its platform.



13. **Suction Filter**. You will have been supplied with either a fixed suction filter (FAFF) or a floating suction filter (SAFF). To fit the fixed filter, screw the brass nipple into the pumps' suction port and then screw on the 90º bend attached to the filter. To fit the floating filter, attach the 1m length of corrugated suction hose (with pre-fitted brass fittings) to the inlet (bottom) port of the pump in the same way. The floating suction filter can now be fitted to the other end of this hose. Ensure all joints are tight.

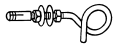


14. **Float switch**. Fit the float switch assembly according to the instructions supplied with the unit. The worm-drive clamp can be fitted to the body of the pump, but ensure it is not likely to foul on the suction filter. The 'switch point' of the float switch must be above the level at which the suction filter can no longer extract water, we recommend fixing the clamp approximately 30cm above the base of the pump.



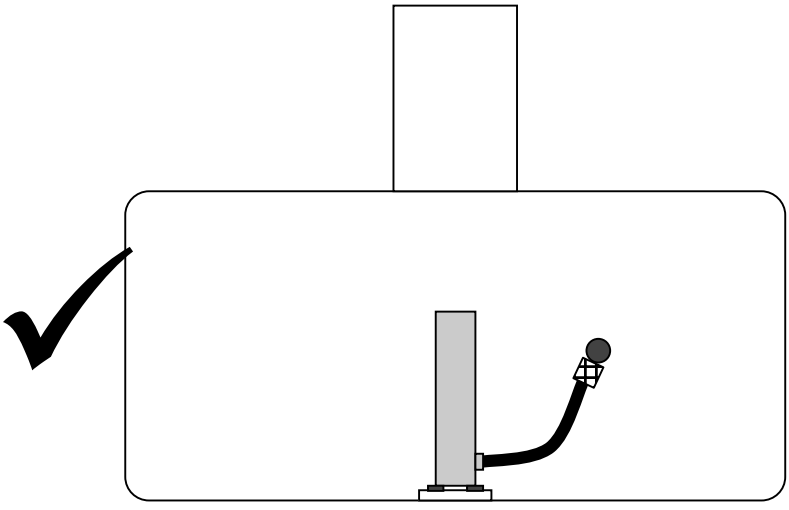
15. The cables from the pump and the float switch should be bound with the rubber hose using cable ties or similar to avoid them becoming tangled or caught up. However, ensure there is sufficient loose cable to allow free movement of the float switch. <u>N.B. – DO NOT OVERTIGHTEN CABLE TIES, they should be firm but should not distort the hose or electrical cables. Ensure the float switch is able to move up and down freely.</u>

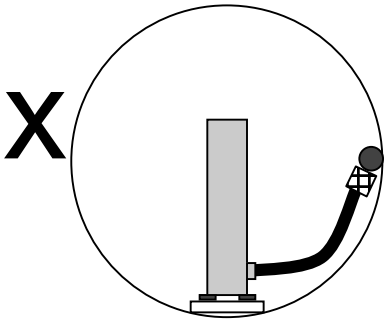
16. <u>Carefully</u> lower the complete assembly (pump, float switch and suction filter) into the tank using the cord supplied that attaches to the ring on top of the pump. This cord must remain attached in case you ever need to remove the pump. The loose end should be tied to a convenient point where it can be easily reached. We supply a stainless steel eye for this purpose, which can be fitted to the inside of the shaft, below the lid, once the cover level has been decided. *N.B. - Rainsava tanks are fitted with a platform directly below the access shaft on which the pump should stand.*



17. The cables from the pump and the float switch must be fed through the duct pipe to the building. These can be pulled through using the draw cord that was previously placed in the duct. Note – if you are installing a tank level gauge with your system, it is wise to also include the tubing supplied with this with the cables, thus drawing all three through the duct at the same time.

18. <u>For pumps fitted with a floating suction filter (SS 99 31)</u> - Once in the tank, orientate the pump so that the suction filter is facing along the length of the tank – this ensures that there is no risk of the filter becoming caught on the side of the tank as it empties. *N.B. - Systems using smaller tanks (less than 3000L) are supplied with a fixed suction filter (SF 99 21) and this eliminates the problem.*



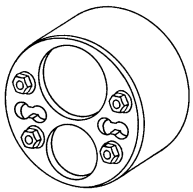


19. With the pump in its final position, connect the 32mm MDPE pipe from the service duct to the brass elbow fitting at the top of the rubber pressure hose. Ensure the pump sits steadily on its platform. It should be vertical and should not have any lateral pressure exerting upon it from the outlet hose. IF this can not be achieved with the pump in position AND with the water level at least half way up the pump, THEN the pump may need to be primed.

Stage 3 - Interior work

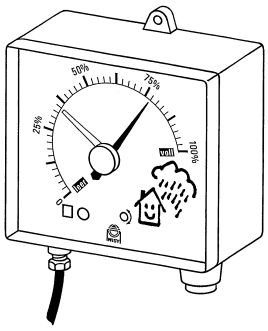
The duct from the tank should terminate in a convenient location within the building (e.g. utility room). The following services should be present within the duct:

a) Delivery pipe from pump
b) Pump power supply cable
c) Float switch power supply cable
d) Small-bore tube from pneumatic level gauge (if used)



Pipe bung

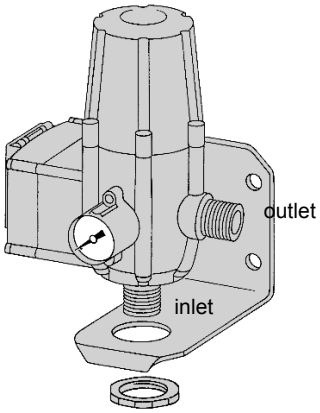
If a proprietary pipe bung is to be used then the pipes and cables should be passed through it at this point. The bung can then be inserted into the end of the duct pipe to form a seal. Alternatively, the end of the duct should be sealed by some other means to prevent cold moist air from the tank entering the building.



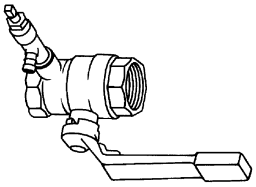
20. **Water Level Indicator** (if supplied). Mount the display unit in a suitable location inside the building. Follow the separate instructions supplied with this unit.

The air tube that is supplied with the unit should be long enough to reach to the base of the tank. Additional tube and connectors are available if required.

21. **Pump Controller**. This device serves to automatically switch the pump on and off as and when required. It also provides the pump with dry-running protection. Fix the '*Controlmatic*' flow controller unit (SA 04 00) to the wall using the mounting bracket supplied. N.B. - this device must be mounted in an upright position, i.e. with the inlet at the bottom. Separate instructions are supplied with this unit. Note that the unit can be mounted with the outlet either to the right or the left (ensure that the blanking screw is fitted in the unused pressure gauge hole at the back of the unit). Connect the MDPE pipe from the pump to the bottom inlet port of the flow controller with the 1" brass fitting provided.

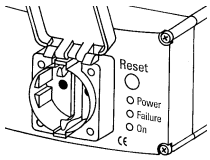


'Controlmatic' pump controller



22. Fit the 1" isolating valve with drain cock on the outlet side of the '*Controlmatic*' unit to assist in any future maintenance of the system. The internal pipework to supply toilets/washing machine/taps can now be connected to this valve.

23. Connect the plug on the end of the pump power cable into the socket of the *Controlmatic* unit. Fit the UK standard plug to the *Controlmatic* unit and then connect into the mains power supply. (Do not switch on yet!)



24. **Mains top-up assembly**. This consists of four items;

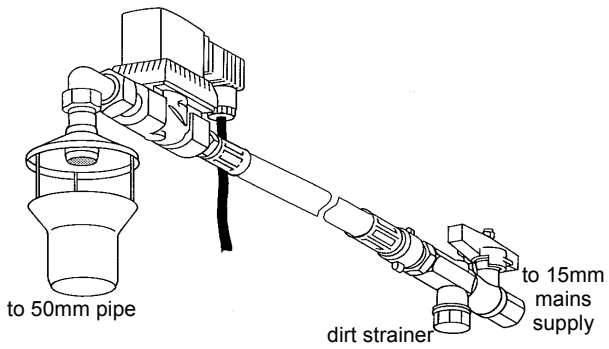
i).a special 'piggy back' plug
ii).a UK 2-pin adapter
iii).a special float switch mounted on a worm-drive clamp
iv).a solenoid valve/tundish assembly.

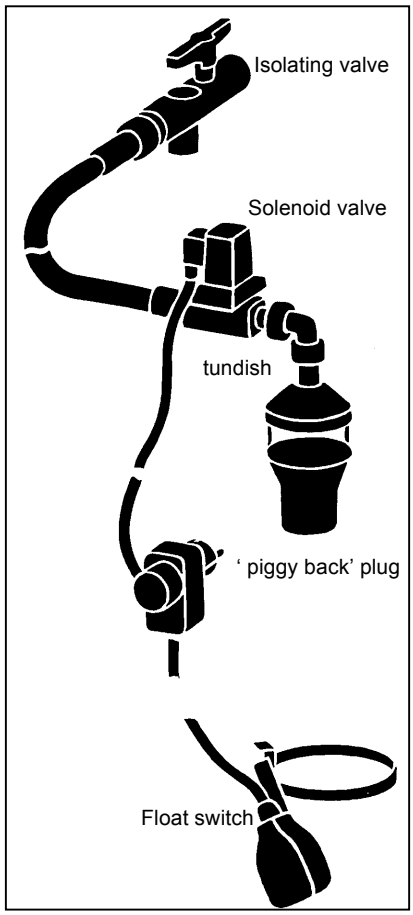
The float switch should already have been fitted to the pump and should now be located in the tank. (see point 14 on page 9)

N.B. the mains water pipework must be flushed through prior to connecting to the assembly.

Refer to the separate instructions that are supplied with this kit.

25. Fit the hose with the solenoid valve and tundish assembly. The tundish fits directly into the 50mm waste pipe you previously installed. (see sketch on page 12) Connect the other end of the assembly to the mains water supply, having first closed the integral manual isolating valve. N.B. – built into this valve is a dirt strainer designed to protect the solenoid valve from any particles that may cause it to malfunction. This strainer should be periodically removed and cleaned if necessary.





26. Connect the lead from the float switch into the special 'piggy back' adapter according to the instructions supplied with the top-up kit.

27. Plug the European plug from the solenoid valve into the socket of the 'piggy-back' adapter. Plug this into the UK adapter and then this in turn into a mains power supply.

Stage 4 - Commissioning

28. Turn on the power to the top-up circuit. If the tank is still empty at this stage, the solenoid valve will open and the mains water top-up will activate. If necessary (e.g. if splashing occurs at the tundish), reduce the flow by adjusting the manual valve on the top-up assembly. Check that the solenoid valve shuts off the mains supply when the water in the tank raises the float switch. If the tank is full to at least above the yellow float switch on the pump, the solenoid valve will remain closed. It is necessary to lift and reposition the pump so that the float switch falls and rises, in order to check that the top-up works as it should.
29. Turn on the power to the pump. (Now that you have some water in the system), The pump should activate and begin pumping water. Turn on a tap connected to the system or flush a toilet several times to purge the air from the pipework. If the pump cuts off before pumping water, and the "failure" light comes on, press and hold the red 'Start' button on the *Controlmatic* switch until it starts pumping. (you may need to do this more than once). In some cases it may be necessary to prime the pump. One way of achieving this is to open a pipe fitting between the pump and the controller (which contains the non-return valve), when the fitting is opened air will be able to escape, and, any air in the pump (below the water line) will be displaced by water.
30. As soon as the pump is running and air has been pumped out of the system, use the valve on the outlet of the controller to shut off the supply to the rainwater distribution system to check that the pump switches off, this should happen about four seconds after the valve is shut. IF THE PUMP FAILS TO TURN OFF PLEASE PHONE FOR TECHNICAL ADVICE.
31. Check all pipes and joints for signs of leaking and rectify accordingly. Also check the system pressure on the gauge fitted to the *Controlmatic* switch, it should read about 4 bar just before the pump switches off and should settle at about 3 bar after the pump switches off. The gauge should then remain steady until demand for rainwater causes the pressure to drop and the pump to switch on again. If the gauge does not remain steady when the pump is off, without rainwater demand, then either: -
    - There is a leak in the system or
    - The WC valves are dripping and need attention.
    - The non-return valve in the controlmatic is allowing water to return to the tank.

    If the system is left running in this condition the long term life of the pump will be adversely affected.
32. Apply marker tape to all pipes in the building that are connected to the system, such as the supply pipes to the WCs and washing machine. The pipes should be clearly labelled along their entire length and labelling should state that the pipes content is 'unwholesome', 'non-potable', 'not for drinking' or similar. This clearly identifies the water as being other than from the mains supply:

RECLAIMED WATER NON-POTABLE

33. Similarly, any taps, valves and any other outlets connected to the system should be clearly identified. We stock a self adhesive label for this purpose;

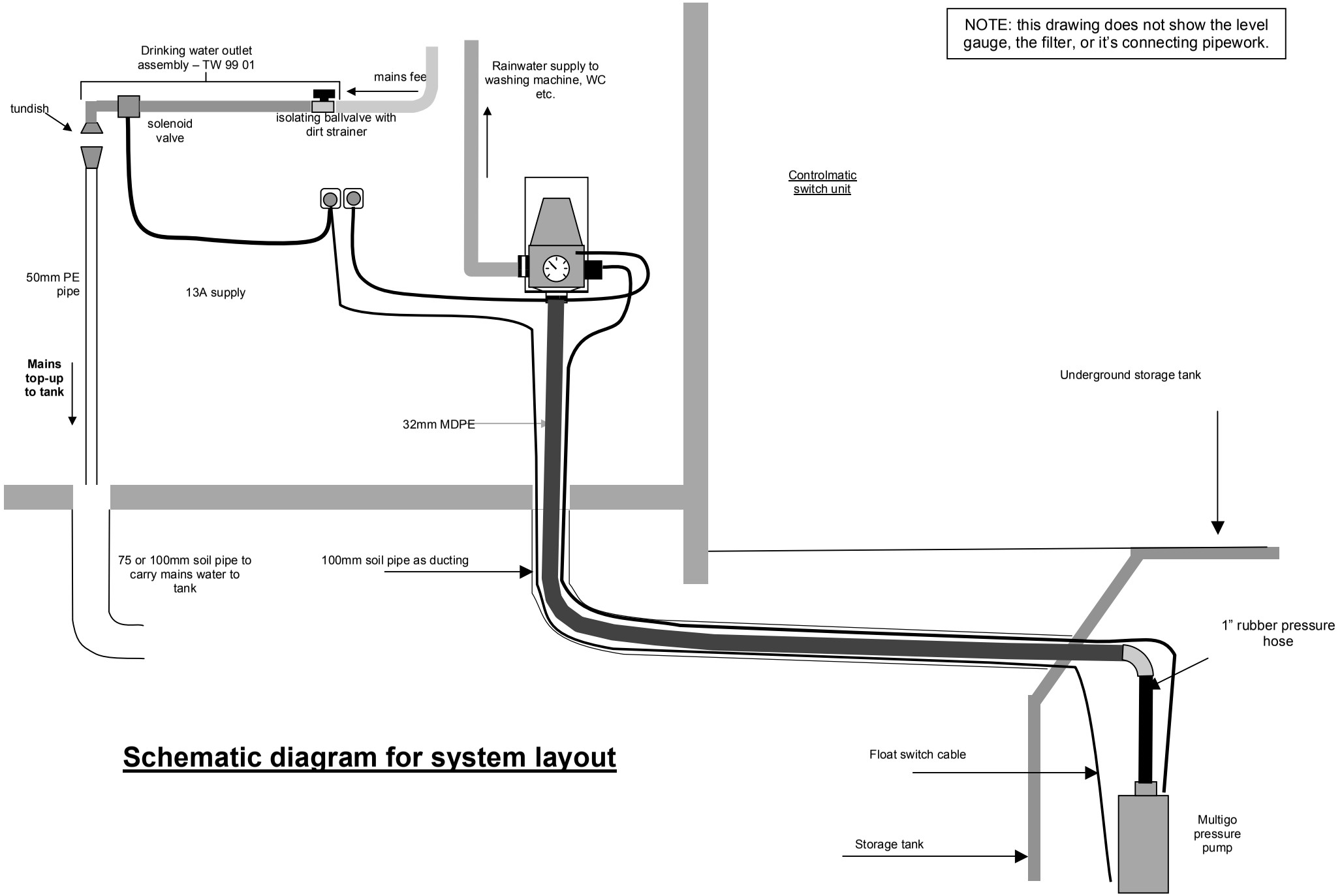
The system should now be operational.

If you encounter any problems or are unsure about how to proceed with any part of the installation, please call our support line on 0845 223 5430.

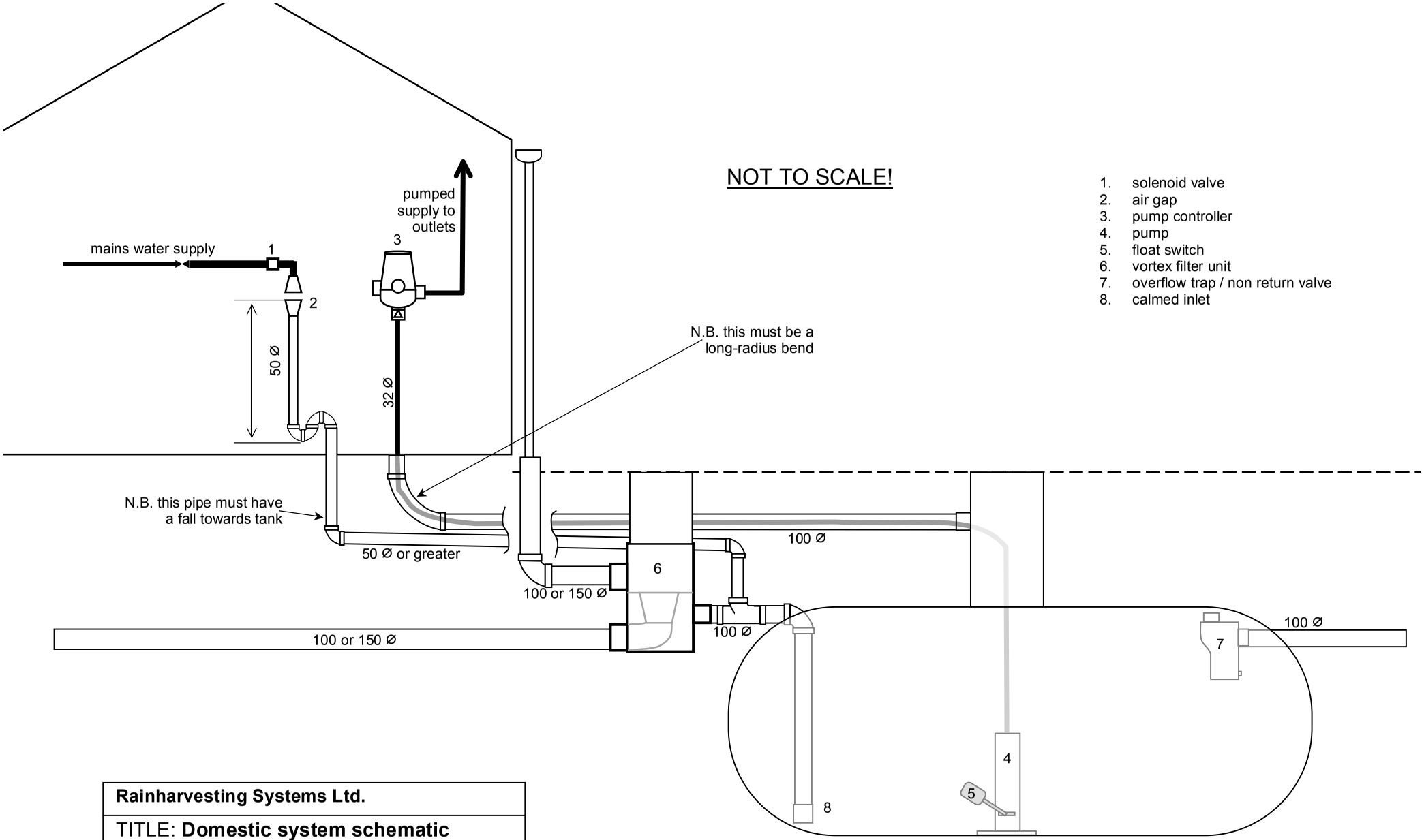
Operation of the System

- Your rainwater system should require no further routine attention other than regular checking and cleaning of the WFF filter insert. Normally, every couple of months is enough, but check regularly at first until you establish the appropriate time interval for your situation. If a lot of dust is present the cleaning times may be more frequent. N.B. it is very important that the filter is kept clean and failure to do so will result in a decrease in efficiency.
- At the same time as cleaning the filters it is advisable to perform three other checks:-
  1. Check that the area around the mainswater top-up is free of any clutter that might dislodge the tundish or obstruct the water flow and cause splashing.
  2. Turn the power to the pump controller off and on again while observing the warning lights and the pressure gauge. If there is no demand for rainwater the power light and the pump running light should come on (The pressure gauge will probably rise), the pump running light should remain on for about five seconds and then go out (The pressure gauge will probably fall slightly when the pump goes off). If the pump stays on, use the valve on the outlet of the controller to shut off the supply to the rainwater distribution system and check again that the pump switches off, IF THE PUMP FAILS TO TURN OFF PLEASE PHONE FOR TECHNICAL ADVICE.
  3. If the system is serving WCs check that the pump does not cycle off and on again at the end of each fill, this could be caused by a dripping ballcock in one of the cisterns.
- If for any reason you need to prevent the WFF filter from operating (e.g. work on the storage tank or the inlet pipe), a 'blind' filter insert is available for hire from Rainharvesting Systems Ltd. This allows all the water to pass directly to the soakaway outlet.

We are continually striving to improve our products and we welcome any feed back from clients and installers that may assist us.



Schematic diagram for system layout



Rainharvesting Systems Ltd.	
TITLE: **Domestic system schematic**	
FILE NAME: **RH152**	
DRAWN BY: **DH**	
DATE: August 10	
SIZE: **A4**	